UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,026	04/21/2005	Yves-Marie Morgan	33901-174PUS	6761

7590 03/02/2009

Thomas Langer
Cohen Pontani Lieberman & Pavane
551 Fifth Avenue Suite 1210
New York, NY 10176

EXAMINER	
PEREZ, JAMES M	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
03/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,026	MORGAN ET AL.	
	Examiner	Art Unit	
	JAMES M. PEREZ	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

This action is responsive to the Request for Continued Examination (RCE) filed on 2/4/2009.

Currently, claims 1-4 and 6-8 are pending.

Response to Arguments

1. Applicant's arguments with respect to claims 1-4 and 6-8 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki (US 2002/0154690) in view of Kennedy et al. (US 2002/0181576) in further view of Primrose et al. (US 2004/0062279).

With regards to claims 1 and 8, Okazaki teaches a method and receiver for synchronizing symbols at an output of a blind equalizer (figs. 4 and 9: paragraphs 60-63 and 66), and that the receiver and method comprising the steps of:

inserting into a succession of sent symbols, one or more known synchronization sequences of symbols (figs. 4, 5, and 9: paragraphs 5, 15, 60-63, 66, and 68: unique words and data);

detecting said one or more known synchronization sequences in a succession of symbols at the output of said blind equalizer (fig. 4: paragraphs 5, 15, 60-63, 66, and 68);

deducing any shifting of the symbols in the succession of symbols at the output of the blind equalizer from the result of said detection (fig. 4: paragraphs 5, 15, 60-63, 66, and 68); and

retiming the symbols at the output of the blind equalizer (fig. 4: paragraphs 5, 15, 60-63, 66, and 68), as a function of the deduced shift of the symbols (fig. 4: paragraphs 5, 15, 60-63, 66, and 68), between a synchronization sequence for which a shift is deduced and a preceding synchronization sequence (paragraphs 68 and 72-73).

Okazaki does not explicitly teach two Limitations: Limitation 1) on sending, one or more known synchronization sequences of symbols are repeated at regular intervals in said succession of symbols; and Limitation 2) the function of the deduced shift of the symbols by eliminating symbols from or adding symbols to the succession of symbols at the output of the blind equalizer, wherein the number of symbols added or eliminated corresponding to the deduced shift of the symbols.

Limitation 1)

Kennedy teaches on sending, one or more known synchronization sequences of symbols are repeated at regular intervals in said succession of symbols (paragraphs 27-29).

One of ordinary skill in the art at the time of the invention would clearly understand that benefits of repeating at regular intervals the insertion of at least one

known synchronization sequence since such a modification would clearly provide reduced jitter and timing errors of the received signal in a multi-path channel at the receiver, thus repeating synchronization symbol at standard time intervals clearly increases synchronization of the transmitted signal at the receiver over time (i.e. channel and synchronization tracking). Therefore it would be obvious to one of ordinary skill in the art the time of the invention to modify the system and method of Okazaki with the teachings of Kennedy in order to improve synchronization at the receiver by reducing jitter and timing errors in the received signal due a multi-path channel over time.

Limitation 2)

Primrose teaches a function of a deduced shift of the bits by eliminating bits from or adding bits to the succession of bits at a receiver (figs. 7-8: paragraphs 61-63), wherein the number of bits added or eliminated corresponding to the deduced shift of the bits (figs. 7-8: paragraphs 61-63).

One of ordinary skill in the art would clearly understand the benefits of retiming a signal by eliminating or adding bits/symbols to a succession of bit/symbol with reference to two synchronization sequences since such a modification provides a low complexity method of achieving increased synchronization and alignment of the data frame (correction of unwanted shifts in the data). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the known receiver (including timing adjuster at the output of the blind equalizer) as disclosed in Okazaki with the known teachings of Primrose in order to yield the predictable results and

benefits of a low complexity method of achieving increased synchronization in a received signal that had a timing slip due to blind equalization (including correction of the frame's alignment: Primrose: paragraph 63).

With regards to claim 2, Okazaki in view of Kennedy in further view of Primrose teaches the limitations of claim 1.

Okazaki teaches detecting a known inserted synchronization sequence at the output of said blind equalizer (figs. 4, 5, and 9: paragraphs 5, 15, 60-63, 66, and 68: unique words and data).

Okazaki does not explicitly teach detecting a known synchronization sequence inserted, on sending, into a succession of symbols, the symbols at the output of the equalizer are correlated with said synchronization sequence and the resulting correlation peaks are detected.

Kennedy teaches detecting a known synchronization sequence on sending, into a succession of symbols, the symbols at the output of the equalizer are correlated with said synchronization sequence and the resulting correlation peaks are detected (paragraphs 27-30).

One of ordinary skill in the art at the time of the invention would clearly understand that benefits correlating a known inserted synchronization sequence in receiver since such a modification would increase synchronization accuracy (less jitter and time errors) at said receiver especially in a multi-path channel. Therefore it would be obvious to one of ordinary skill in the art the time of the invention to modify the

system and method of Okazaki with the teachings of Kennedy in order to improve synchronization at the receiver by reducing jitter and timing errors in the received signal due a multi-path channel over time.

With regards to claim 4, Okazaki in view of Kennedy in further view of Primrose teaches the limitations of claim 2.

Okazaki teaches MLSE equalizer estimates an amplitude, a phase, and a delay time of a signal that arrives with a time variance based on a multi-path propagation by using known series called a unique word at the receiver side (paragraph 4).

Okazaki does not explicitly teach the result of said correlation is used to determine information on the phase of the signal carrier that carries the received symbols and that information is used to resolve ambiguity as to the phase of the symbols at the output of the equalizer.

Kennedy teaches detecting a known synchronization sequence on sending, into a succession of symbols, the symbols at the output of the equalizer are correlated with said synchronization sequence and the resulting correlation peaks are detected (paragraphs 27-30). One of ordinary skill in the art would clearly understand using the correlation of the unique word to determine information on the phase of the signal carrier that carries the received symbols and that information is used to resolve ambiguity as to the phase of the symbols at the output of the equalizer, since such a modification is common and well-known in the art and has the known benefits of increase an equalizers ability to mitigate ISI (inter-symbol interference) due to a multi-

path propagation channel. Therefore, it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system and method of Okazaki with the teachings of Kennedy in order to improve synchronization at the receiver by reducing jitter and timing errors in the received signal and interference due a multi-path channel over time.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki (US 2002/0154690) in view of Kennedy et al. (US 2002/0181576) with Primrose et al. (US 2004/0062279), as applied to claim 1 above, further in view of Lin et al. (USPN 6,813,325).

With regards to claim 6, Okazaki in view of Kennedy in further view of Primrose teaches the limitations of claim 1.

Okazaki teaches retiming the symbols at the output of the blind equalizer (fig. 4: paragraphs 5, 15, 60-63, 66, and 68), as a function of the deduced shift of the symbols (fig. 4: paragraphs 5, 15, 60-63, 66, and 68), between a synchronization sequence for which a shift is deduced and a preceding synchronization sequence (paragraphs 68 and 72-73).

Okazaki in view of Kennedy further in view of Primrose do not explicitly teach said symbols are eliminated just after the synchronization sequence preceding the synchronization sequence for which a shift is detected.

Lin teaches retiming frames by eliminated from or added to the succession of bits between two synchronization sequences (col. 3, lines 45-65; col. 7, lines 9-48; col. 8, lines 15-30; and col. 9, lines 5-32).

One of ordinary skill in the art would clearly understand that in order to eliminating bits as stated above by Lin, one would obviously determine at least one location in the bit stream (succession of bits) to remove/eliminate bits from, thus yielding the benefits of retiming the frame (correcting unwanted shifts in the frame). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and method (including blind equalizer and alignment circuitry) of Okazaki in view of Kennedy in further in view of Primrose with the teachings Lin since eliminating symbols has the advantage of being a low complexity method of mitigating timing wander/slip/jitter in a data stream by realigning the data stream to known synchronization points (relative timing points).

Furthermore at the time the invention was made, it would have been to a person of ordinary skill in the art to eliminate said symbols just after the synchronization sequence preceding the synchronization sequence for which a shift is detected. The applicant does not disclose that eliminating said symbols just after the synchronization sequence preceding the synchronization sequence for which a shift is detected provides an advantage, is used for a particular purpose, or solves a stated problem in the art. One of ordinary skill in the art would have expected Applicant's invention to perform equally well with eliminating said symbols just after the synchronization sequence preceding the synchronization sequence for which a shift is detected. Therefore it

would have been to modify the system and method (including blind equalizer and alignment circuitry) of Okazaki in view of Kennedy in further in view of Primrose with the teachings of Lin since eliminating symbols at least one location in a symbol stream has the advantage of being a low complexity method of mitigating timing wander/slip/jitter in a data stream by realigning the data stream to known synchronization points (relative timing points).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki (US 2002/0154690) in view of Kennedy et al. (US 2002/0181576) in further view of Primrose et al. (US 2004/0062279), as applied to claim 2 above, further in view of Peon et al. (USPN 7,027,499).

With regards to claim 3, Okazaki in view of Kennedy in further view of Primrose teaches the limitations of claim 2.

Okazaki does not explicitly teach the detected correlation peaks are compared to a given threshold and the symbols are not retimed unless a peak higher than said threshold is detected.

Peon teaches the detected correlation peaks are compared to a given threshold and the symbols are not retimed unless a peak higher than said threshold is detected (col. 4, line 45 through col. 5, line 29).

Therefore it would be obvious to one of ordinary skill at the time of the invention to combine the synchronization method and system of Okazaki in view of Kennedy with

the corrective action correlation and threshold logic of Peon in order to reduce the power consumption of a digital system and increase synchronization accuracy and convergence.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki (US 2002/0154690) in view of Kennedy et al. (US 2002/0181576) in further view of Primrose et al. (US 2004/0062279) as applied to claim 1 above, further in view of Labat (USPN 5,909,466).

With regards to claim 7, Okazaki in view of Kennedy in further view of Primrose teaches the limitations of claim 1.

Okazaki does not explicitly teach the blind equalizer has a switchable structure, uses a switchable algorithm, and, in a convergence mode of operation, includes in cascade a purely recursive whitening filter and a matched transversal filter that is reinitialized as a function of the performance of the equalizer.

Labat teaches the method characterized in that the blind equalizer has a switchable structure, uses a switchable algorithm (col. 6, lines 23-45), and

in a convergence mode of operation, includes in cascade a purely recursive whitening filter and a matched transversal filter that is reinitialized as a function of the performance of the equalizer (col. 6, line 49 through col. 7, line 49).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to combine the synchronization and blind equalization system and method of

Okazaki with the adaptive blind equalizer circuit of Labat since such a modification has the known benefits of improved convergence and tracking, and improved adaptation to channel fluctuations in severe situations (Labat: col. 5, lines 1-15).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. PEREZ whose telephone number is (571)270-3231. The examiner can normally be reached on Monday through Friday: 9am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James M Perez/
Examiner, Art Unit 2611
2/24/2009
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611